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TI Total sputtering yield of **Ag/Cu** alloys for low energy argon ions

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AB Measurement of the total sputtering yields of **Ag/Cu** two-phase alloy **targets** for normally incident 200 and 100 eV Ar+ ions were performed. The dose was .apprx.1019 ions and the **target** temp. was held at .apprx.20.degree.. A graph of total sputtering yield vs. **Ag/Cu** (at.%) compn. is V-shaped with the yield of all compns. being lower than either pure **Cu** or pure **Ag**. The total sputtering yield is defined as the no. of sputtered atoms of any type divided by the no. of incident ions. The total yield was calcd. assuming stoichiometric component ejection during the entire bombardment time. The validity of this assumption and its effect on the results is discussed. The surfaces of the sputtered **targets** were covered with a variety of pronounced cones, ridges, and pebble-like features. It is hypothesized that a redeposition shadow effect is responsible for the lowered yield. When the developing surface features or projections become tall enough, material ejected from one projection will be redeposited onto neighboring projections resulting in a reduced sputtering yield. The V-shaped yield vs. compn. curve is very similar in structure to the **Ag/Cu** solidification curve in the **Ag/Cu** phase diagram. A plausible explanation for this correlation follows from the fact that the av. crystallite sizes of the alloy compns. scale with the solidification curve. Compns. with the lowest melting temp. have the smallest av. crystallite sizes. The smaller the crystallites the faster they will be covered by the yield lowering surface projections. Selective sputtering and surface diffusion fed seed cones appear to be the two most important mechanisms contributing to the formation of the roughened surface topog.